June 4, 2001

Gailen R. Hart
Manager, Environmental Affairs
ExxonMobil Chemical Co.
13501 Katy Freeway
Houston, TX 77079-1398

Dear Mr. Hart:

The Office of Pollution Prevention and Toxics is transmitting EPA's comments on the robust summaries and test plan for the Alkyl Acetates C6-C13 Category, posted on the ChemRTK Web Site on February 7, 2001. I commend ExxonMobil for its commitment to the HPV Challenge Program.

EPA reviews test plans and robust summaries to determine whether the reported data and test plans will provide the data necessary to adequately characterize each SIDS endpoint. On its Chemical RTK HPV Challenge Program website EPA has provided guidance for determining the adequacy of data and preparing test plans used to prioritize chemicals for further work.

In general, ExxonMobil's category concept is reasonable. However, as detailed in the attached Comments, the Company needs to better characterize the category members by supplying information on the identity of specific components and their typical percentages; supply measured data for certain physicochemical and fate endpoints; and revise robust summaries to clarify two biodegradation summaries and address deficiencies in one developmental toxicity summary. The robust summaries for the ecotoxicity studies do not allow a determination of data adequacy because they lack key study conditions and sufficient characterization of test substances, which the Company needs to supply.

EPA agrees with the test plan suggestion that the water solubility of the C11-C14 ester is too low for the substance to elicit acute ecological effects. The Company should consider a 21-day chronic daphnid test for that ester as more likely to detect toxic effects.

As with other submissions where the available data are either inadequate or insufficiently documented, this case will remain open until adequate documentation is in hand.

EPA will post this letter and the attached Comments on the Chemical RTK web site within the next few days. As noted in the comments, we ask that the Company advise the Agency, within 60 days of the posting on the Chemical RTK website, of any modifications to its submission.

If you have any questions about this response, please contact Richard Hefter, Chief of the HPV Chemicals Branch, at 202-260-3470. Submit general questions about the HPV Challenge Program through the Chemical RTK web site comment button or through the TSCA Assistance Information Service (TSCA Hotline) at (202) 554-1404. The TSCA Hotline can also be reached by e-mail at tsca-hotline@.epa.gov.

I thank you for your submission and look forward to your continued participation in the HPV Challenge Program.

Sincerely,

/s/

Oscar Hernandez, Director
Risk Assessment Division

Attachment

cc: W. Sanders
A. Abramson
C. Auer
M. E. Weber

EPA Comments on Chemical RTK HPV Challenge Submission: Alkyl Acetates C6-C13 Category

SUMMARY OF EPA COMMENTS

The sponsor, ExxonMobil Chemical Company, submitted a Test Plan and Robust Summaries to EPA dated December 21, 2000 for the Alkyl Acetates C6-C13 Category. EPA posted the submission on the ChemRTK Web site on February 7, 2001. The proposed information-gathering plan is for six mixtures (see Category Definition, below) considered by the sponsor to constitute a category.

EPA has reviewed this submission and has reached the following conclusions:

1. The sponsor's category concept is reasonable. However, although the category members are all mixtures, the submission does not provide any information about the composition of the category members other than the carbon number range and the descriptor "branched." For substances of this nature, the sponsor needs to supply information at least on the identity of specific components and their typical percentages.

2. Summaries of existing data did not include information on the components of the mixtures tested. The submitter needs to better characterize the identity of the test substances.

3. Physicochemical and Environmental Fate Data. (a) The submitter proposes estimation of physicochemical data using EPIWIN. EPA strongly recommends that the submitter provide measured data as much as possible for these substances. (b) For the fugacity model the sponsor proposes using the values calculated by the EPIWIN suite of programs. Measured data should be used as inputs to the model wherever possible. The sponsor should state which compounds will be used in the model and how combinations of chemicals will be characterized. A Level 3 EQC model should be used rather than the proposed Level 1. (c) Biodegradation: clarifying information is needed for the study summaries for biodegradation.

4. Health Endpoints. All appropriate SIDS tests have been performed. The sponsor needs to address deficiencies in one of the developmental toxicity robust summaries; see "Specific Comments on Robust Summaries".

5. Ecotoxicity. EPA is unable to determine if data are adequate for some studies because the extent and timing of test concentration measurements are unclear, and other important information is lacking. In addition, for the C11-C14 ester a Daphnid chronic test appears more appropriate than the short-term testing summarized in the submission.

EPA is requesting that the Sponsor advise the Agency within 60 days of any modifications to its submission.

EPA COMMENTS ON THE ALKYL ACETATES C6-C13 CATEGORY

Category Definition

The substances are branched and linear hexanol, acetate (CAS No.88230-35-7), and the branched alkyl acetates C6-8 (CAS No. 90438-79-2), C7-9 (CAS No. 108419-32-5), C8-10 (CAS No. 108419-33-6), C9-11 (CAS No. 108419-34-7) and C11-14 (CAS No. 108419-35-8). While the title of the category is "Alkyl Acetates C6-C13 Category," C11-C14 branched alkyl acetate esters are included in the Test Plan. The Test Plan text notes that the dominant alkyl alcohols used to make the esters are C6-C13, but no explanation is given about the presence or concentration of C14 alkyl alcohols.

The submission does not provide any information about the composition of the category members other than the carbon number range and the descriptor "branched." Ideally, the number and identity of components and their typical percentages would be available, and component overlap between the different mixtures would be better understood. However, not even minimal analytical information was supplied. This creates difficulty for the reviewer in trying to evaluate the submission or interpret the

available data for some endpoints.

Category Justification

The submitter notes that this category is "scientifically justifiable because their physicochemical and toxicological properties are very similar and follow a regular pattern as a result of the synthesis process." When multiple members of the proposed category were evaluated by similar testing, the available data tended to be similar among category members, lending support to the categorization. Moreover, these data suggested a low order of acute and subchronic toxicity, as well as little teratogenic and genotoxic potential for different members of this category. Although the C11-C14 branched alkyl acetate esters do not appear to fall into the same pattern of ecotoxicity and biodegradation as the other members of the group, this may be a natural break point reflecting changes in certain test-related properties such as water solubility.

As noted in the previous section, the submission provides only nominal information about the composition of the category members. The sponsor needs to supply more detailed information in order to fully support the category proposal.

Test Plan

In general, the available data were generated on mixtures of uncharacterized composition. Unless the individual components are to be tested, adequate characterization of complex test mixtures is essential for future testing.

Chemistry (melting point, boiling point, vapor pressure, water solubility, and partition coefficient (log P))

The submitter proposes to estimate physicochemical data using EPIWIN. While the test plan refers to using measured data where available, the discussion was very brief, with no indication of the amount and type of data available. EPA strongly recommends that the submitter provide measured data as much as possible for these chemicals (generally, the log P value can be calculated for chemical classes that have been validated for the calculation). The submitter also needs to provide information on the identity of the chemicals tested.

Fate (photodegradation, stability in water, biodegradation, and transport/distribution)

Photodegradation – EPA agrees with the sponsor's approach to this endpoint.

Stability in Water – EPA agrees with the sponsor's approach to this endpoint.

Chemical Transport and Distribution in the Environment – The sponsor plans to run an EQC Level 1 fugacity model using the properties calculated by the EPIWIN suite of programs. The sponsor, however, does not state which compounds will be used in the model nor how combinations of chemicals will be characterized. For mixtures it seems useful to calculate values for both low and high molecular weight components to provide ranges of values for the different mixtures. A Level 3 model should be used rather than the proposed Level 1, because of the additional information that is developed. For inputs to the model, adequate measured values are preferred to calculated values (see Chemistry, above).

EPA recommends using the EQC level 3 model from the Canadian Environmental Modeling Centre at Trent University. This model can be found at the following Web address: http://www.trentu.ca/academic/aminss/envmodel/.

Biodegradation – Biodegradation data were obtained for four of the six esters in this category. The submitter states that there are adequate data for this endpoint and concludes that no further testing is required. However, in each case the test substance composition was not characterized. For biodegradability the nature and extent of branching is critically important. A fully substituted carbon on a linear alkyl chain in the C6 to C14 carbon range changes the biodegradability dramatically compared to one or two isolated methyl substituents. The sponsor needs to supply whatever composition information is available for the studies. Otherwise, typical composition ranges may help

evaluate the data.

Health Effects.

The submitter supplied adequate data for at least two category members for each of the SIDS health endpoints. EPA agrees with the proposed test plan for health effects endpoints for the purposes of the U.S. HPV Challenge Program. The submitter presented the health data in a matrix format that was useful to reviewers.

Ecological Effects.

EPA is unable to determine if data are adequate for these endpoints. Except in the case of the C6 branched and linear alkyl acetate ester, the extent and timing of test concentration measurements for these tests is unclear from the summaries. No water solubility values were reported for any of the chemicals. Because of the many questions related to these data, EPA requests that the submitter provide the full study underlying each aquatic test summary.

Acute tests with the water-accommodated fraction (saturated solution) of the C11-C14 ester produced no mortalities to either fish or daphnia and no growth inhibition to algae. EPA agrees with the submitter's suggestion that this is because the water solubility of the ester is too low to elicit acute effects.

In many such cases of low solubility, chronic toxicity tests are more informative than acute tests. In the case of the C11-C14 ester, the 21-day chronic daphnid test is more likely to detect toxic effects at or below the aqueous solubility limit. EPA recommends that such testing be carried out for the C11-C14 ester. Such chronic testing should employ an analytical method able to detect test substance at or below its water solubility limit. While a full characterization of the category for this effect would probably also require chronic testing of one of the midrange esters such as C9-C11, to help determine where chronic toxicity initially appears in the category, EPA cannot evaluate the need for such testing without additional information on the chemical makeup of the category members.

Specific Comments on the Robust Summaries

Stability in Water

The submitter provided Robust Summaries for CAS No. 88230-35-7, C6 branched and linear alkyl acetate ester, and for CAS No. 90438-79-2, C6-C8 branched alkyl acetate ester. Both Robust Summaries are adequate for the purposes of the HPV Program.

Biodegradation.

CAS No. 88230-25-7: C6 branched and linear ester

The summary cites the Gledhill test but states that it used a non-acclimated inoculum. This is contradictory, since by definition the Gledhill test uses an acclimated inoculum and is not a ready biodegradability test. Thus, the reviewer cannot determine the adequacy of this test without clarifying information. Further, the test substance identity was not characterized.

CAS No. 108419-35-8: C11-C14 branched ester. The sponsor needs to supply a better description of the method used. If this test uses an acclimated inoculum then it may not be describing ready biodegradability.

Health Effects

In general, the robust summaries were well prepared and presented the information necessary to

understand the study design and results. However, in each case the test substance was not characterized.

Specific comments:

Developmental toxicity study (Bio/Dynamics, Project No. 330334, CAS No. 108419-32-5): This robust summary is deficient because it did not provide the incidence by dose and statistical results for the observed malformations and embryotoxicity. In addition, the types of malformation and toxicity need to be stated.

Ecotoxicity Studies

Robust summaries were submitted for experimental studies on fish, Daphnia, and green algae.

All the tests submitted were performed with water-accumulated fractions (WAFs). In general, the robust summaries lacked sufficient data to assess the studies. Examples include information on when chemical concentrations were monitored during the experiment, whether the chemical was measured at time zero and other times during the test, and whether nominal treatment concentrations equal loading concentrations; background Total Organic Carbon (TOC); and water solubility values.

Fish Toxicity

CAS No. 90438-79-2: C6-C8 fish toxicity test. Missing data are percentage composition of test substance components and gas chromatography results.

CAS No. 88230-25-7: C6 semistatic fish test: It is unclear whether measured or nominal concentrations were provided since both were mentioned ambiguously in the summary.

CAS No. 108419-35-8: C11-C14 fish toxicity acute test: Reported nominal concentrations. The analytical method used (TOC) was unable to detect the test substance at the concentrations tested.

CAS No. 108419-32-5: C7-C9 fish toxicity test: did not provide background TOC and time of renewal for each concentration was not reported.

Daphnid Toxicity

CAS No. 88230-25-7: C6 ester: Summary reported only static nominal concentrations; background TOC was not given.

CAS No. 108419-34-7: C9-C11 ester. Summary did not include the GC-MS analytical results to identify chemicals in samples tested.

CAS No. 108419-32-5: C7-C9 ester. Summary was inadequate because only nominal concentrations were reported; TC method is insufficient to adequately characterize the chemicals tested.

CAS No. 108419-35-8: C11- C14 ester. Summary reported only percent of WAF as nominal concentration. TC and TOC are used interchangeably in the report and need to be clarified. TOC is an acceptable method in WAF tests but EPA questions the use of the TC method which reports all organic content in the samples tested.

Algal Toxicity

CAS No. 88230-25-7: C6 ester: Summary provided nominal rather than the preferred measured concentrations.

CAS No. 108419-32-5: C7-C9 ester. It is unclear when the concentrations were measured. The study is inadequate because the background TOC was 3.3 mg/L instead of the required < 2 mg/L.

CAS No. 108419-35-8: C11- C14 ester. The TC analytical method is insufficient to adequately characterize the chemicals tested.

Followup Activity

EPA is requesting that the Sponsor advise the Agency within 60 days of any modifications to its submission.